

PCT/DE2004/002291

Igus GmbH

5

Line guide device

10

Claims

1. Line guide device for guiding lines, comprising a plurality of links (2) connected to each other in articulated fashion, where at least some, or all, of the links (2) each display a bottom element (3), opposite side walls (4) and at least one cover element (5a, 5b), forming a duct (6) for accommodating lines, where the plurality of links (2) are integrally moulded on one another in one piece, forming a continuous strand, and where the line guide device (1) can be arranged to form a lower run (7), a curved section (8) and an upper run (9), where the bottom element (3) and both opposite side walls (4) of the links are designed in one piece as U-sections that are essentially rigid under the intended loads, and where the cover element (5a, 5b, 40, 83) of the respective link is integrally moulded on at least one side wall (4) of said link and designed to be moveable relative to the side wall, and can be moved into a position closing the link and a position at least essentially releasing the area between the opposite side walls, characterised in that mutually corresponding stops of adjacent links are provided, which interact in the straight position and/or curved position of the line guide device and are in each case located on the cover elements (5a, 5b) of the adjacent links and/or are provided by overlapping areas of ad-

35

AMENDED PAGE

jacent links in the form of tabs (47), which are integrally moulded in one piece on the side walls (4) and/or cover elements (5) of at least some links and, starting from a first position, can be moved into a second position, in which they overlap a partial area of an adjacent link.

2. Line guide device according to Claim 1, characterised in that the line guide device (1) is manufactured as a one-piece plastic part.
3. Line guide device according to Claim 1 or 2, characterised in that a closing means (13), integrally moulded in one piece, is provided on the cover element (5a, 5b), being connectable in detachable fashion to a corresponding closing means (13a) to form a line guide device that is closed on the cover side, where the corresponding closing means is located on the side wall (4) of the respective link, or in that the cover element is of two-part design and the closing element is integrally moulded in one piece on the cover element part of the respective link opposite the first cover element part.
4. Line guide device according to one of Claims 1 to 3, characterised in that adjacent links (2) are provided with stops (19, 20) that correspond to each other and come into contact with each other when the line guide device (1) is in the straight position, and in that at least one of the corresponding stops of adjacent links is provided on a cover element (5a, 5b) and/or on the inner sides of the side walls (4) facing towards the duct (6) and/or the outer sides of the side walls (4) facing away from the duct and/or the upper side of the side wall facing away from the bottom element (3) of the link.
5. Line guide device according to one of Claims 1 to 4,

characterised in that the stop (19) is designed as an area of the cover element which, in the straight position of the line guide device, projects onto the adjacent link (2) and, in stop position, engages a recess provided with a stop in a cover element and/or a side wall of the adjacent link.

6. Line guide device according to one of Claims 1 to 5, characterised in that the cover elements (5) of the line guide device are designed in such a way that they provide a closed upper side of the line guide device in the straight position of the line guide device.

7. Line guide device according to one of Claims 1 to 6, characterised in that the cover elements (5) of the line guide device are designed in such a way that they also provide a closed upper side of the line guide device in the curved position of the line guide device.

8. Line guide device according to one of Claims 1 to 7, characterised in that at least some cover elements (5) of the links are provided with at least one integrally moulded projecting area (17), which forms overlapping areas (15, 17) with at least one of the respectively adjacent links in the straight and/or curved position of the line guide device, and in that stop elements (19, 22) acting in stop position are located on the overlapping areas of the respectively adjacent links.

9. Line guide device according to one of Claims 1 to 8, characterised in that at least some cover elements (5) are provided on both sides with integrally moulded projecting areas (15), which project to-

wards both adjacent links and in each case overlap the cover element of the adjacent links, or projecting areas (17) projecting from the adjacent cover elements towards the respective link.

5

10. Line guide device according to one of Claims 1 to 9, characterised in that the stop is designed as a peg (22) projecting from the respectively overlapping area transverse to the longitudinal direction of the line guide device, and in that the respectively corresponding stop displays a recess (23) receiving the peg, in which the peg (22) is accommodated over at least part, or all, of the pivoting movement of adjacent links relative to each other.

15

11. Line guide device according to one of Claims 1 to 10, characterised in that, in the straight position of the line guide device (1), the face ends (12) of the side walls (4) of respectively adjacent links that face each other are spaced apart from each other, at least over part, or all, of their height.

20

12. Line guide device according to one of Claims 1 to 11, characterised in that the bottom element (3) and/or the side wall (4) of at least one, or both, of the respectively adjacent links is provided with a projection (101), which projects onto the adjacent link and, in the curved position of the line guide device, can be brought into contact with an opposite area (103) of the adjacent link.

25

30

13. Line guide device according to one of Claims 1 to 12, characterised in that fastening elements (25, 25a, 25b) corresponding to each other are integrally moulded in one piece on the ends of the line guide

35

device, by means of which the line guide device can be assembled to a line guide device of identical design, extending the length of the same.

- 5 14. Line guide device according to Claim 13, characterised in that at least one fastening element is provided on one end thereof, and corresponding fastening elements are provided on several or all links (2) of the line guide device, these being connectable to
10 each other, at least after adjusting the length of the line guide device.
- 15 15. Line guide device according to one of Claims 1 to 14, characterised in that, on at least some links, at least one dividing web (30a) is provided between opposite side walls of the link, which acts as a partition for the interior space and is connected to the bottom element (3) in one piece.
- 20 16. Line guide device according to one of Claims 1 to 15, characterised in that at least some cover elements (5) of the links engage at least one, or both, of the adjacent links and are located with an area (15) between opposite side walls of the respectively adjacent link, and in that the area located between the side
25 walls (4) displays a width essentially corresponding to the distance between the side walls (4).
- 30 17. Line guide device according to one of Claims 1 to 16, characterised in that the line guide device displays, over at least essentially the length of the bottom element interconnecting several links, or over a distance in the longitudinal direction of the line guide device between two adjacent links that are earthed or provided with an earthing device, which are preferably con-
35

nected to each other via a continuous bottom element, or over the full length of the line guide device, an electrical resistance R of approx. 20,000 ohms or less.

5 18. Line guide device according to one of Claims 1 to 17,
c h a r a c t e r i s e d i n t h a t the line guide
device displays, over at least essentially the length of
the continuous bottom element interconnecting several
10 the line guide device between two adjacent links that are
earthed or provided with an earthing device, which are
preferably connected to each other via a continuous bottom
element, or over the full length of the line guide device,
an electrical surface resistance R_s or an end-to-end re-
15 sistance R_e or a point-to-point resistance R_p of $\leq 1 \times 10^{10}$
ohms.

19. Line guide device according to one of Claims 1 to 18,
c h a r a c t e r i s e d i n t h a t the line guide
20 device displays, over at least essentially the length of
the continuous bottom element interconnecting several
links, or over a distance in the longitudinal direction of
the line guide device between two adjacent links that are
earthed or provided with an earthing device, which are
25 preferably connected to each other via a continuous bottom
element, or over the full length of the line guide device,
an electrical resistance of $R_g \leq 1 \times 10^{12}$ ohms to an EPA
earthing point connected to the line guide device, or to
an EPA earthing device connected to the line guide device.

30